

1 1. A purified nucleic acid comprising a nucleotide sequence that encodes a naturally  
2 occurring protein that: (a) shares at least 80% sequence identity with SEQ ID NO:2 and (b) has  
3 at least one functional activity of native XB3.

1 2. The nucleic acid of claim 1, wherein the nucleotide sequence defines a  
2 polynucleotide whose complement hybridizes under high stringency conditions to the nucleotide  
3 sequence of SEQ ID NO:1.

1 3. The nucleic acid of claim 1, wherein the protein has an amino acid sequence  
2 consisting of SEQ ID NO:2.

1 4. The nucleic acid of claim 1, wherein the protein specifically binds to XA21.

1 5. A vector comprising the nucleic acid of claim 1.

1 6. The vector of claim 5, wherein said nucleic acid is operably linked to one or  
2 more expression control sequences.

1 7. A cell comprising the nucleic acid of claim 1.

1 8. A purified protein that: (a) comprises an amino acid sequence that shares at least  
2 80% sequence identity with SEQ ID NO:2 and (b) has at least one functional activity of native  
3 XB3.

1 9. The protein of claim 8 whose amino acid sequence is SEQ ID NO:2.

1 10. The protein of claim 8, wherein the protein is a fused heterologous polypeptide.

1 11. A purified protein comprising a polypeptide selected from the group consisting of  
2 amino acid residues 1-10 of SEQ ID NO:2; amino acid residues 11-305 of SEQ ID NO:2; and  
3 amino acid residues 319-385 of SEQ ID NO:2.

1 12. A purified antibody that specifically binds to the protein of claim 8.

1           13.    The antibody of claim 12, further comprising a detectable label.

1           14.    A screening method for identifying a substance that modulates binding of an XB3  
2 protein to XA21, the method comprising the steps of:

- 3                   (a)    providing a sample containing the XB3 protein;  
4                   (b)    adding to the sample a candidate substance;  
5                   (c)    adding to the sample XA21; and  
6                   (d)    detecting an increase or decrease in binding of the XB3 protein to XA21  
7 in the presence of the candidate substance, compared to the binding of the XB3 protein to XA21  
8 in the absence of the candidate substance, as an indication that the candidate substance  
9 modulates binding of XB3 protein to XA21.

1           15.    A method of producing an XB3 protein comprising the steps of:

- 2                   (a)    providing a cell transformed with an isolated nucleic acid comprising a  
3 nucleotide sequence that encodes an XB3 protein;  
4                   (b)    culturing the cell under conditions that allow expression of the XB3  
5 protein; and  
6                   (c)    collecting the XB3 protein from the cultured cell.

1           16.    A screening method for identifying a substance that modulates expression of a  
2 gene encoding XB3, the method comprising the steps of :

- 3                   (a)    providing a test cell;  
4                   (b)    contacting the test cell with a candidate substance; and  
5                   (c)    detecting an increase or decrease in the expression level of the gene  
6 encoding XB3 in the presence of the candidate substance, compared to the expression level of  
7 the gene encoding XB3 in the absence of the candidate substance, as an indication that the  
8 candidate substance modulates the level of expression of the gene encoding XB3.

1 17. A method for isolating a substance that binds XB3 comprising the steps of:  
2 (a) providing a sample of an immobilized XB3;  
3 (b) contacting a mixture containing the XB3-binding substance with the  
4 immobilized XB3;  
5 (c) separating unbound components of the mixture from bound components  
6 of the mixture; and  
7 (d) recovering the XB3-binding substance from the immobilized XB3  
8 protein.

1 18. The method of claim 17, wherein the XB3-binding substance is XA21.

1 19. A method of modulating disease resistance in a plant cell or seed, the method  
2 comprising the steps of:  
3 (a) providing a plant cell or seed having a first disease resistance phenotype;  
4 (b) introducing into the plant cell or seed a purified nucleic acid comprising a  
5 nucleotide sequence that encodes a naturally occurring protein that: shares at least 80% sequence  
6 identity with SEQ ID NO:2 and has at least one functional activity of native XB3 to create a  
7 transformed plant cell or seed,  
8 wherein the purified nucleic acid is selected such that it produces a second  
9 disease resistance phenotype in the transformed plant cell or seed that differs from the first  
10 disease resistance phenotype.

1 20. The method of claim 19, wherein the naturally occurring protein lacks at least one  
2 functional activity of native XB3 selected from the group consisting of: ability to bind XA21,  
3 ability to be phosphorylated by XA21, and ubiquitin ligase activity.

1           21.     A method of modulating disease resistance in a plant cell or seed, the method  
2 comprising the steps of:  
3           (a)     providing a plant cell or seed having a first disease resistance phenotype;  
4           (b)     introducing into the plant cell or seed a purified nucleic acid that  
5 modulates expression of native XB3 to create a transformed plant cell or seed,  
6                     wherein the purified nucleic acid is selected such that it produces a second  
7 disease resistance phenotype in the transformed plant cell or seed that differs from the first  
8 disease resistance phenotype.

1           22.     The method of claim 21, wherein the purified nucleic acid hybridizes under  
2 stringent hybridization conditions to a nucleic acid selected from the group consisting of SEQ ID  
3 NO:1 and the complement of SEQ ID NO:1.

1           23.     A method of modulating disease resistance in a plant cell or seed, the method  
2 comprising the steps of:  
3           (a)     providing a plant cell or seed having a first disease resistance phenotype;  
4           (b)     introducing into the plant cell or seed a purified nucleic acid that encodes  
5 a polypeptide that inhibits a functional activity of native XB3 to to create a transformed plant  
6 cell or seed;  
7           (c)     culturing the transformed plant cell or seed under conditions in which the  
8 polypeptide is expressed,  
9                     wherein expression of the polypeptide in the transformed plant cell or  
10 seed produces a second disease resistance phenotype in the transformed plant cell or seed that  
11 differs from the first disease resistance phenotype.

1           24.     The method of claim 23, wherein the polypeptide shares at least 80% sequence  
2 identity with SEQ ID NO:2 and has at least one functional activity of native XB3.